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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/670,214	09/25/2000	Christine E. Browning	9010-3	4277

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EXAMINER	
NEGIN, RUSSELL SCOTT	
ART UNIT	**PAPER NUMBER**
1631	

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/670,214	BROWNING ET AL.	
	Examiner	Art Unit	
	Russell S. Negin	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-16,26-39,48-61 and 87-101* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-16,26-39,48-61 and 87-101* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Notes

Claims 2-16, 26-39, 48-61, and 87-101 are currently pending and are examined in this Office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catena et al. [OH&S

Canada, September/October 1992, volume 8, issue 5, pages 72-78] in view of Platt [1994, High Consequence Operations Safety Conference, New Mexico].

Claim 87 states:

87. A method of conducting a process hazard analysis (PHA), comprising the following steps that are performed in a data processing system:
selecting a chemical process to be evaluated;
selecting a study type to be performed on the chemical process;
conducting the selected study type on the chemical process in the data processing system, wherein the chemical process is evaluated in the data processing system for the presence of a hazard scenario;
generating a resolution plan to the hazard scenario in the data processing system, wherein the resolution plan comprises a final action item, at least one interim action item to be completed prior to the completion of the final action item and at least one target date for completing an action item; and
tracking the resolution plan in the data processing system, to monitor for completion of action items, wherein the status of the resolution plan is monitored for completion of action items by the target date.

Claim 92 and 97 are a data processing system and computer program product for conducting the same body of the method of instant claim 87, respectively.

Claims 6, 29, 31, 35, 51, 57, and 53 claim an initial study as part of either a study type, a selecting means, or a conducting means for a method or computer readable code.

Claims 5, 7, 32, and 54 refer to dividing the process into nodes prior to the conducting step.

Claim 10 claims the step of customizing the study step prior to the conducting step.

Claim 11 claims a customizing step comprising a list of questions to evaluate the chemical process.

Claims 28, 30, 50, and 52 claim a selecting or conducting means comprising a means for selecting a revalidation study as a method or computer programming device.

Claim 61 is a computer program product for generating a resolution plan for the hazard scenario.

Claims 88, 93, and 98 claim a method further comprising the step of generating at least one report.

Claims 89, 94, and 99 claim that this report comprises a description of the hazard scenario and resolution plan.

Claims 90, 95, and 100 claim the generation of a resolution database for a resolution plan.

Catena et al., states on page 73 under the first sentence in "Taking Stock," "At any processing operation, accurate, and field verified piping and instrument diagrams are essential to permit a meaningful process hazard analysis (PHA) or emission release to be done." Piping is a chemical process in that it enables reaction and transportation of chemicals in a chemical engineering system. The main study to be performed is on process hazards or emission release.

Catena et al. states on pages 74 (column 2: lines 5-15 and lines 41-45) and 75 lines (column 2, last four lines).

The passages of Catena et al. state:

The major steps of a piping and instrumentation diagram update are:

Passage #1: page 74, column 2, lines 5-15
Determining intelligent PID standards and data definition;
Gathering existing PIDs
Verifying process unit field information and PID field mark-ups;

Drawing computer aided designs of PIDs;
Engineering review of process and instrumentation;
Selecting database, design, and configuration;
Standardizing report design;
Reviewing and updating final PIDs; and
Maintaining the database and updating the diagrams.

Passage #2: page 74, column 2, lines 41-45

This method often does not place critical process units on the same drawing, which then hinders their use especially when performing a HAZOP analysis. Rearrangement of the diagrams in process-flow order can be done without too much difficulty, if planned for in advance.

Passage #3: page 75, column 2, last four lines

The amount of time required to produce a complete field-verified, intelligent piping and instrumentation diagram has ranged from 20 to more than 80 hours per drawing.

Passage #1 describes a limitation of claim 87 by showing a selected study type can be performed on a data processing system. Passage #2 indicates that this step is for HAZOP [hazard and operability analysis].

This method is also used a resolution plan as the last sentence of passage #2 indicates with the "rearrangement" procedure.

The tracking and target date aspects are indicated in the third passage, with the target date [or time] being from 20 to more than 80 hours per drawing.

Catena et al., states on page 76, the first paragraph under "The Database:"

The selected database should be an off-the-shelf, widely used, fully programmable relational database, such as Paradox™, R:Base™, and dBase™ programs. As well, spreadsheets such as Lotus 1-2-3TM can be used for specialized reports. The use of standard relational database software allows flexibility in the design of plant-specific data stored and in its reporting.

Thus this passage qualifies database systems and computer software to the method claimed in instant claim 87.

The quotation in large print on page 73 states, "Creating and using intelligent piping and instrument diagrams of refineries and chemical plants isn't just good planning, it's good safety." The concept of "creating" indicates an initial study.

Each pipe can be considered a node. According to the definition in the instant specification on page 4, lines 28-32, which states, "Based on available process information such as Piping & Instrumentation Diagrams 30 (PID's), known chemical procedures, chemical hazard information and the like, the process to be evaluated then may be broken into sub-processes or segments called "nodes," as defined further herein." A pipe is a segment in a pipeline.

The bullet lists at the top of the second column on page 74 of Catena et al. states, "The major steps of a piping and instrumentation diagram update are: determining intelligent PID standards and data definition."

On page 77 of Catena et al., where a checklist of required information is presented, one item is in the form of a question which states (page 77, column 1. lines 3-4), "Are serial numbers needed for each piece of equipment?"

On page 73, the third sentence under "Taking Stock," states, "Many companies that have started to update their old PIDs have found the process far more difficult, time consuming and expensive that they ever imagined." Thus, the "updating" of PIDs is a form of revalidation.

On page 74, column 1, lines 19-22, states, "Intelligent piping and instrument diagrams can be used to support hazard and operability analysis (HAZOP), failure

mode and effects analysis (FMEA), fault tree analysis, and other sophisticated risk analysis programs."

This HAZOP analysis is indicative of a report which can be used to assist in resolution plan and hazard scenario.

The last paragraph of "The Database" section of page 76 states, "In addition to supporting the original engineering users, the drawings and database can be used to improve operator process and safety awareness, to assist in operator training, to help plan and support plant maintenance, or to plan plant 'turnarounds.'"

However, Catena et al fails to describe the actual execution of a PHA; Catena shows how to produce intelligent PIDs which are necessary for PHAs.

The article of Platt, entitled, "Use of process hazard analysis to control process hazards," describes execution of such PHAs to processes analogous to those described in Catena et al.

As stated in the last paragraph of page 2 of Platt, "Process Hazard Analysis (PHA) has been called the cornerstone of chemical process safety management, because it serves as a tool to systematically identify the causes and consequences of potential accidents associated with equipment, instrumentation, utilities, human performance, and external factors."

Platt continues on pages 3 and 4 by describing the application of a PHA to a specific DOE chlorination process. In the last paragraph of page 3, Platt states, "One form of PHA, the hazard and operability (HAZOP) study, has the potential to analyze chemical process hazards as well as associated operating procedures. The HAZOP is

a guide-word-stimulated brainstorming approach systematically applied to important process parameters to determine the impact of potential deviations from design conditions."

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify Catena et al. in view of Platt to result in the claimed invention because while Catena et al described PIDs as applicable to PHAs and HAZOP, Platt has the advantage of executing the actual PHA in the form of a HAZOP on an analogous process.

Claims 2, 4, 15, 16, 26, 27, 38, 39, 48, 49, 55, 60, 90-92, 96, 97, 100-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catena et al. in view of Platt as applied to claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above in further view of Herrington [Process Safety Progress, volume 15, 1996, pp. 110-113].

Claims 2 and 26 claim groups to which the study type is selected, including the Tennessee Eastman Division Process Hazard Analysis (TEDPHA).

Claims 15, 38, 48, 55, and 60 claim documentation of the hazard scenario and resolution plans.

Claims 16 and 39 claims where the resolution plan encompasses more than one action item.

Claims 91, 96, and 101 contain information on contacts to reach to execute the resolution plan.

Claims 4, 27, and 49 relate to a "Worst Case Credible Consequence hazard scenario.

Catena et al. gives information pertinent to the base claims (i.e. a method of conducting a process hazard analysis). The objective of Catena et al. is stated under "Taking Stock" on page 73 of Catena et al. which states, "At any processing operation, accurate, and field verified piping and instrument diagrams are essential to permit a meaningful process hazard analysis (PHA) or emission release to be done." However, Catena et al. do not give information on the limitations of the above claims (i.e. the groups from which the study is selected, the hazard scenario, the resolution plan, how to execute the resolution plan).

Additionally, Platt does not describe these limitations, as it is an article describing how to executed PHAs in the form of HAZOPs.

However, Herrington does teach these limitations. For claims 2 and 26, on lines 32-37 in column 1 on page 110 in Herrington state that the safety risk analysis was performed with the Tennessee Eastman Division of Eastman Chemical Company.

Lines 4-10 on column 1 of page 110 in Herrington state, "One key provision of the regulation calls for a Mechanical Integrity (MI) program to ensure that process equipment containing and controlling highly hazardous chemicals is maintained to high standards, standards which minimize the chances of accidental release and subsequence injuries or incidents."

Figure 1 of Herrington on page 110 shows more than one action item in the Mechanical Integrity structure plan.

Herrington shows that the approach described is a team based approach, made up of people who can be contacted in the event of a hazard or need for a resolution.

It would have been obvious to prepare for the worst credible case scenario. As stated in M.P.E.P. section 2144, "Rationale may be in a reference, or reasoned from common knowledge in the art, scientific principles, art-recognized equivalents, or legal precedent." In this case, it can be reasoned from common knowledge of the art to prepare for the worst case scenario. See, for example: *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); or *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

It would have been obvious to someone of ordinary skill in the art at the time the invention was made to modify the pipeline Catena et al. in view of Platt as applied to claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above, in further view of the team based approach of Herrington because Herrington improves upon the method of Catena et al and Platt by applying a general safety method to specific agencies and scenarios with resolution plans.

Claims 8-9, 12-14, 33-34, 37, 56, 57, 59, 87, 92, and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catena et al. in view of Platt as applied to claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above in further view of Summers [Hydrocarbon Asia; October 1997, pages 46, 48].

Claims 8, 9, 33, and 34 claim a risk ranking and a risk matrix as part of a conducting step.

Claims 12-14 claim a risk matrix, a consequence severity, and a frequency of occurrence of a consequence.

In claim 37, the risk matrix is used to evaluate a chemical process.

Claims 56 and 59 are computer readable code for generation and evaluation of a risk matrix.

Catena et al. gives information pertinent to the base claims (i.e. a method of conducting a process hazard analysis). The objective of Catena et al. is stated under "Taking Stock" on page 73 of Catena et al. which states, "At any processing operation, accurate, and field verified piping and instrument diagrams are essential to permit a meaningful process hazard analysis (PHA) or emission release to be done." However, Catena et al. or Platt do not give information on using risk rankings and matrices.

However, Summers shows such a risk matrix on page 48, column 1; this matrix and its uses address the aforementioned claims. Such a plot shows a level of risk ranking and a risk matrix which illustrates consequence severity as a function of event likelihood. In addition, this risk matrix is used to evaluate a chemical process.

It would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the pipeline safety method of Catena et al. in view of Platt as applied to claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above in further view of the risk matrix of Summers, thus resulting in the instant invention, because Summers elaborates on the method of quantification of risk using risk matrices and rankings for the purpose of assigning target safety integrity levels for safety instrumented systems.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Catena et al. in view of Platt as applied to claims 5-7, 10-11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above in further view of Wharton et al. [Risk Management Under OSHA's Process Safety Rule and Clean Air Act Amendments of 1990 – Session 76a; AIChE 1993 Spring National Meeting, 1993; Air Products Chemicals Inc.].

Claim 3 claims a PHA which complies with the Process Safety Management (PSM) standard and the Environmental Protection Agency Risk Management Plan (EPA RMP).

Catena et al. gives information pertinent to the base claims (i.e. a method of conducting a process hazard analysis). The objective of Catena et al. is stated under "Taking Stock" on page 73 of Catena et al. which states, "At any processing operation, accurate, and field verified piping and instrument diagrams are essential to permit a meaningful process hazard analysis (PHA) or emission release to be done." However, while Catena et al. or Platt disclose the method of the base claim of a process hazard analysis, they fail to explicitly apply it as a PSM or an EPA RMP.

Wharton et al. state in the third paragraph of the introduction, "The OSHA PSM and the EPA RMP are being coordinated by the agencies. The PSM is intended to protect on-site workers and the RMP is for the protection of the health of the offsite community and the environment." Thus, this statement describes the limitation of dependent claim 3.

It would have been obvious to someone of ordinary skill in the art at the time the invention was made to modify Catena et al. in view of Platt as applied to claims 5-7, 10-

11, 28-32, 35-36, 50-54, 57-58, 61, 87-90, 92-95, and 97-100 above in further view of the with the PSM and EPA RMP of Wharton et al., because Wharton et al. uses the specific policies of PSM and EPA RMP to regulate process hazard management.

Response to Arguments

Applicant's arguments filed May 17, 2006 have been fully considered but they are not persuasive.

Applicant argues on pages 2-4 of the remarks of May 17, 2006 that "intelligent PIDs may be used as inputs for the PHA, but they are not themselves a PHA."

In response to this argument, the Platt reference is obtained and combined with the previous "Catena et al" anticipatory rejection to rectify this discrepancy.

The applicant further argues that the first two steps of claim 87 are not described since Catena et al. does not in detail describe a chemical process. However, the PIDs are diagrams and piping systems for refineries and chemical plants that conduct chemical processes. Each PID corresponds to one or more of these processes.

Applicant further argues that the third step of claim 87 is not taught by Catena et al. because the reference does not teach PHA in a data processing system. However, the third step does not claim a PHA, but rather, the presence of a hazard scenario. Passage #2 on page 6 of the previous Office action details the fact that HAZOP can analyze a hazard scenario. HAZOP analysis is the hazard and operability analysis used in the data processing system explained in Passage #1 on page 6 of the previous Office action.

Applicant further argues that the fourth step of claim 87 is not taught by Catena et al because a resolution plan is not discussed. However, the sentence cited in Catena et al. (Page 74, column 2, lines 41-45) states, "Rearrangement of the diagrams in process-flow order can be done without too much difficulty, if planned for in advance." This "rearrangement" of diagrams qualifies as a resolution plan. Rearranging pipes in response to a hazard or potential hazard is a plan to resolve the safety discrepancy.

Applicant further argues that the fifth step of claim 87 is not taught by Catena et al. because a specific date is not taught. However, the sentence cited in Catena states, "The amount of time required to produce a complete field-verified, intelligent piping and instrumentation diagram has ranged form 20 to more than 80 hours per drawing." The phrase, "20 to more than 80 hours per drawing" serves as a target date to complete the PID and safety analysis.

Applicant further argues that many of the dependent claims are separately patentable.

Applicant argues on page 6 that claims 6, 29, 31, 51 and 53 relate to an initial study which does not exist in the Catena reference. However, the act of "Creating and using intelligent piping and instrument diagrams of refineries and chemical plants..." possesses the act of "creation." Creation of a PID is an initial study of the PID.

Moreover, applicant argues on page 6 that the reference does not teach customization of style type (claims 10 and 35). However, each PID is based on a specific refinery or chemical process with its own given properties.

Applicant argues on page 6 that claims 5, 7, 32, and 54 are patentable because of the misinterpretation of the term "nodes." In the previous Office action on page 7, the definition of the term "nodes" is reiterated from the instant specification. Since a pipe is a segment or sub process in a PID, it qualifies as a node of a PID.

Applicant argues on pages 6 and 7 that claims 28, 30, 50 and 52 are patentable because the PID and not the chemical process is being revalidated. However, the chemical process and the PID are intertwined and dependent on each other. Adjusting a piping diagram affects the chemical process within it.

Applicant argues on page 7 that claim 61 is patentable because the HAZOP and FMEA do not generate resolution plans. However, for example, the function of HAZOP is hazard and operability analysis used to identify hazards and risks affecting performance of the PIDs.

Applicant argues of page 7 that claims 91, 96, and 101 are patentable over Catena et al. in view of Herrington because both Herrington does not show the relevant claim limitations in addition to the references not being combinable. However, there is motivation to combine. As stated in the previous Office action on page 11, the motivation to combine Catena et al. and Herrington is base on their analogous methods of investigating chemical processes. While Catena et al. uses computer systems, Herrington et al utilized teams of people. The resolution plans and target dates are discussed in Catena et al as indicated above. The departments and locations are taught in Herrington. Herrington states that the department and location is (last sentence of abstract), i.e. the "Tennessee Eastman Division."

Since the prior art rejections employing Wharton et al and Summers were not addressed in the Remarks of May 17, 2006, they will assumed to not have been traversed by the applicant.

Conclusion

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the central PTO Fax Center. The faxing of such pages must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Negin, Ph.D., whose telephone number is (571) 272-1083. The examiner can normally be reached on Monday-Friday from 7am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Andrew Wang, Supervisory Patent Examiner, can be reached at (571) 272-0811.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instrument Examiner, Tina Plunkett, whose telephone number is (571) 272-0549.

Information regarding the status of the application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information on the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

-RSN
17 July 2006

17 July 2006

JOHN S. BRUSCA, PH.D
PRIMARY EXAMINER

17 July 2006